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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,640	01/29/2004	Steven S. Watanabe	112056-0171	5422

24267 7590 04/06/2007

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EXAMINER	
SCHELL, JOSEPH O	
ART UNIT	PAPER NUMBER
2114	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/767,640	WATANABE ET AL.	
	Examiner	Art Unit	
	Joseph Schell	2114	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *26 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-11,13-20 and 22-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-11,13-20 and 22-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

Claims 1-2, 4-11, 13-20, 22-35 have been examined.

Claims 1-2, 4-11, 13-20, 22-35 have been rejected.

Response to Arguments

1. Applicant's arguments with respect to all independent claims have been considered but are moot in view of the new ground(s) of rejection.

Request for Interview

2. Applicant's request for a telephonic interview has been considered but the Examiner is of the opinion that such an interview would be unproductive until the Applicant has time to fully review the new grounds of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-2, 4-11, 13-20, 22-24, 28, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over A Highly Available Network File Server (reference 2 from IDS filed January 29, 2004, herein Network File Server) in view of Chen ('098).

4. As per claim 1, Network File Server discloses a method for a coordinated bringup of a repaired storage appliance in a storage appliance cluster, the repaired storage appliance having a disk sub-system (as shown in Figure 1), the method comprising the steps of:

asserting a first state, the first state indicating that the repaired storage appliance awaits release of disk reservations of the disk subsystem by a surviving storage appliance (page 201, second column, second to last paragraph, the re-integration request);

releasing the disk reservations in response to detection of the asserted first state by the surviving storage appliance (page 201, second column, last paragraph, surviving server acknowledges receipt of the request and unmounts corresponding file systems);

initializing the disk subsystem of the repaired storage appliance (page 202, first column, first paragraph, the running of the log and reconstruction of reply cache); and

performing a giveback operation by the surviving storage appliance in response to completed initialization (during the failback process the servers periodically exchange messages and if the re-integrating fails the survivor will reclaim the disks. When the failback is complete a giveback transition is performed and the surviving controller no longer suspects failure. the servers stop communicating directly and instead simply send heartbeat signals to clients (page 202, column 2, first paragraph) and it is up to the clients to detect a server failure).

Network File Server does not expressly disclose the method comprising after initializing the disk subsystem: asserting a second state indicating that the repaired storage appliance has initialized the disk subsystem.

At the time of invention it would have been obvious to a person of ordinary skill in the art to modify the server failback method disclosed by Network File Server such that a message is sent after initializing the disk subsystem. This modification would have been obvious because periodic messages are exchanged to take care to recover from failures of either server during re-integration (Network File System page 202, second paragraph) and by continuously notifying the failover server of the replacement server's recovery status the failover server will be able to know when the re-integrating server fails and replace the disks as in takeover (Network File System page 202, second paragraph).

Network File Server additionally does not disclose the method wherein the states are asserted in a memory of the repaired storage appliance.

Chen ('098) teaches a network appliance failover (see abstract) wherein messages concerning the status of a failed and failover appliance are stored in a shared storage device (see abstract).

At the time of invention it would have been obvious to a person of ordinary skill in the art to modify the server failback method disclosed by Network File Server such that status messages are exchanged through a memory area instead of by SCSI messaging. This modification would have been obvious because additionally messaging software is not required for a file server (Chen ('098) column 1 line 65 through column 2 line 2 and column 3 lines 24-30).

5. As per claim 2, Network File Server in view of Chen ('098) discloses the method of claim 1 further comprising the steps of:

completing the repaired storage appliance initialization (Network File Server page 202, column 1 paragraph 1); and

processing data access requires by the repaired storage appliance (Network File Server page 202, column 1 paragraph 1).

6. As per claim 4, Network File Server in view of Chen ('098) discloses the method of claim 1 wherein the surviving storage appliance detects the first state by performing a remote direct memory access read operation to the memory (as shown in Network File Server Figure 1, the two servers are networked together, while Chen ('098) teaches messaging through shared storage, as discussed with respect to claim 1, above).

7. As per claim 5, Network File Server in view of Chen ('098) discloses the method of claim 1 wherein the surviving storage appliance detects the second state by

performing a remote direct memory access operation of the memory as shown in Network File Server Figure 1, the two servers are networked together, while Chen ('098) teaches messaging through shared storage, as discussed with respect to claim 1, above).

8. As per claim 6, Network File Server in view of Chen ('098) discloses the method of claim 1 wherein the surviving storage appliance ceases to process data access requests directed to the repaired storage appliance after performing the giveback operation (Network File Server page 202, first paragraph, the repaired server starts serving NFS requests. Since the normal operation is not returned to by the failover server until the entire failback is complete and heartbeat messaging is resumed, the failback server serving of NFS requests happens prior to the giveback. This does not preclude the failback server serving NFS requests after the giveback however).

9. As per claim 7, this claim recites limitations found within claim 1, with the addition of whereby the period of time during which clients of the storage system are without connectivity is minimized. This limitation is disclosed by Network File Server (page 199, column 2, the first bullet at the bottom of the page, recovery must be completely transparent to file-server client applications).

10. As per claim 8, Network File Server in view of Chen ('098) discloses the storage appliance of claim 7 wherein the cluster failover layer is further adapted to perform

routine remote direct memory access read operations to the partner storage appliance to detect a state of the partner storage appliance (Network File Server page 201, second paragraph, both servers perform remote procedure calls to monitor the liveness of the other. In view of Chen ('098), as discussed with respect to claim 1, above, these messages are communicated through shared storage space).

11. As per claims 9 and 10, these claims recite limitations found within claim 1, in addition to the parent limitations as discussed with claims 7 and 8, and are rejected on the same grounds as claim 1, 7 and 8.

12. As per claim 11, this claim recites limitations found within claim 1 and is rejected on the same grounds as claim 1.

13. As per claims 13 and 14, these claims recite limitations found in claims 4 and 5, respectively, and are respectively rejected on the same grounds as claim 4 and 5.

14. As per claim 15, this claim recites limitations found in claim 6 and is rejected on the same grounds as claim 6.

15. As per claims 16 and 17, these claims recite limitations found in claim 1 and are rejected on the same grounds as claim 1.

16. As per claim 18, Network File Server in view of Chen ('098) discloses the method of claim 11 wherein the set of disk reservations comprises small computer systems interface reservations (Network File Server page 200, second column, first sentence).

17. As per claim 19 and 20, these claims recites limitations found in claims 1 and 2, respectively, and are respectively rejected on the same grounds as claims 1 and 2.

18. As per claims 22 and 23, these claims recite limitations found in claims 4 and 5, respectively, and are respectively rejected on the same grounds as claim 4 and 5.

19. As per claims 24, 28 and 32, these claims recite limitations found in claim 1 and are rejected on the same grounds as claim 1.

20. Claims 25-27, 29-31 and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Network File Server in view of Chen ('098), and in further view of Wikipedia's Data Structure article.

21. As per claim 25, Network File Server in view of Chen ('098) discloses the method of claim 24, wherein state status messages are stored in memory accessible by the repaired storage appliance (as discussed with regards to claim 1, above).

Wikipedia's Data Structure article teaches basic uses of data structures in computer science.

At the time of invention it would have been obvious to a person of ordinary skill in the art to modify the status messaging through memory as disclosed by Network File Server in view of Chen ('098) such that the status messages are stored in a data structure. This modification would have been obvious because data structures allow for stored data to be used efficiently (Wikipedia's Data Structure, first sentence).

22. As per claim 26, Network File Server in view of Chen ('098), and Wikipedia's Data Structure discloses the method of claim 25 wherein the surviving storage appliance detects the first state by performing a remote direct memory access read operation to the state data structure (as shown in Network File Server Figure 1, the two servers are networked together, while Chen ('098) teaches messaging through shared storage, as discussed with respect to claim 1, above).

23. As per clam 27, Network File Server in view of Chen ('098), and Wikipedia's Data Structure discloses the method of claim 25 wherein the surviving storage appliance detects the second state by performing a remote direct memory access operation to the state data structure (as shown in Network File Server Figure 1, the two servers are networked together, while Chen ('098) teaches messaging through shared storage, as discussed with respect to claim 1, above).

24. As per claims 29 and 33, these claims recite limitations found in claim 25 and are rejected on the same grounds as claim 25.

25. As per claims 30 and 31, these claims recite limitations found in claims 26 and 27, respectively, and are respectively rejected on the same grounds as claims 26 and 27.

26. As per claims 34 and 35, these claims recite limitations found in claims 26 and 27, respectively, and are respectively rejected on the same grounds as claims 26 and 27.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Specifically, Fung (US Patent Application Publication 2006/0271814) teaches a detailed failback procedure for a migrating server instance implemented in JAVA, and Gadir (US Patent Application Publication 2003/0018927) teaches manual and automatic failover and failback procedures for a clustered virtual server system.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Schell whose telephone number is (571) 272-8186. The examiner can normally be reached on Monday through Friday 9AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott Baderman can be reached on (571) 272-3644. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS

SCOTT BADERMAN
SUPERVISORY PATENT EXAMINER